

# **Method For Fabricating a Gate Electrode**

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## **ABSTRACT OF THE INVENTION**

A method for fabricating a gate electrode is disclosed. The present invention is provided a method to utilize the first nitrogen-containing RTP treatment to treat the substrate to form a first  
10 barrier layer thereon. Then, the dielectric material has high dielectric constant that is deposited on the first barrier layer to improve the thermal stability and chemical stability of the semiconductor substrate. Next, a second barrier layer and a metal gate layer are sequentially formed on the dielectric layer. After a photolithography process, a  
15 gate electrode is formed on the semiconductor substrate. Thereafter, a surface inhibition layer is formed on sidewall of the gate electrode to improve the resistivity and thermal stability for metal gate layer after a second nitrogen-containing RTP treatment is performed on the gate electrode.